

the water, a single dead fly may become a focus of infection for a great number of aquatic animals (fishes, newts, &c.). The whole surface of the tadpole above mentioned was covered with *Saprolegnia*, so that death must have been produced by the suppression of the action of the skin. The second larva, placed in a separate vessel before the introduction of the fly, remained quite intact.—*Séance de la Soc. Vaudoise des Sci. Nat.* July 6, 1887; *Bibl. Univ.* November 15, 1887, p. 492.

*On the Significance of Sexual Reproduction.*

By Dr. B. HATSCHKEK.

Dr. Hatschek recently lectured upon this subject before the meeting of German surgeons in Prague.

In the first place he indicated that the most important and probably original of vital phenomena was *assimilation*. By the process of assimilation new living particles (that is to say particles which in their turn possess the faculty of assimilation) are produced. Assimilation is, as Hatschek affirms, *the sole known mode of production of fresh living substance*. We see in the Amœbæ and other unicellular organisms that the parent-creature divides into two daughter-organisms. In the more complex multicellular organisms reproductive bodies in the form of germs and buds are produced; these are developed, and grow into new individuals of the same kind. In the latter instance, however, the formation of such germs is reduced to a process of division of the same kind as occurs in the unicellular organisms, only that in those cases where we have to do with production of ova, spermatozoa, and buds the portions divided off are very unequal in size. This difference, however, is due to no principal distinction.

Besides division, however, the contrary phenomenon occurs in unicellular organisms, namely the fusion of two originally separate individuals into a single one. This is the so-called "conjugation," which is very widely diffused among the Monoplastida. In the multicellular organisms it is the portions characterized as reproductive bodies that become fused together, therefore the individualities in their simplest state. The conjugation of the unicellular organisms represents the process of fecundation, but *not the copulation of the multicellular forms*.

The intermixture of the individualities is most generally diffused throughout the organic world; and although among multicellular animals we frequently meet with asexual modes of reproduction (such as gemmation, division with regeneration, and parthenogenesis), we find this always only along with sexual reproduction, *i. e.* alternating therewith.

When we find any process generally occurring in organisms the question of its significance involuntarily forces itself upon us. We ask directly, What does this arrangement do for the organism, what purpose has it for it? After citing and criticizing the views of Bütschli, Hensen, van Beneden, and Weismann, Hatschek expresses his own theoretical opinion, namely *that in sexual reproduction we must recognize a remedy against the action of injurious variability*.

He supports this theory as follows:—In the first place he starts from the truth, ascertained by the experience of breeders, that a certain degree of difference between the parent individualities is most favourable to the result of a crossing. Such differences which are caused in the organism by the external conditions of life would evidently be of no service in asexual reproduction. A disease which made its appearance in an individual which propagated solely by the method of gemmation would be inherited from generation to generation and endanger the existence of the entire species. But if a mingling of the diseased with perfectly healthy protoplasm (such as must necessarily occur in sexual reproduction) be brought about, we have not merely the possibility, but even the highest probability, of a rectification such as can be obtained in no other way. It is, in Hatschek's opinion, in furnishing the opportunity for such rectification that we must find the chief use of the existence of sexually differentiated individuals among animals and plants.—*Prager mediz. Wochenschrift*, No. 46, 1887; *Biologisches Centralblatt*, No. 21, January 1, 1888, pp. 654–666.

*Notice of two new Branchiopod Crustacea from the Trans-Caspian Region.* By Dr. ALFRED WALTER.

The species described are as follows:—

1. *Apus Haeckelii*, n. sp.

*A. lamina caudali coniformi, acuminata, incarinata neque spinulosa, duplo longiore quam lata. Sinu postico scuti angulato armatoque dentibus 30. Ramo longissimo primi pedis angulos scuti excedente. Segmentis posterioribus 16–17 scuto non obtectis, posteremis 6 apodibus. Colore scuti et corporis in vivo albido flavescente, pedum rosaceo.*

*Hab.* In a desert spring near Karadschatatyr, north of the Lower Atrek, in the Russian Trans-Caspian.

A female was taken early in May, together with species of *Estheria*, *Branchipus*, and some Cladocera and Ostracoda. The species belongs to Grube's second group of *Apus*, in which there is a caudal lamina separating the long caudal appendages (with *A. productus*, *A. glacialis*, &c.). It differs from all known allied species in the unkeeled and spineless caudal lamina.

2. *Artemia asiatica*, n. sp.

*A. processibus caudalibus digitiformibus, setas 8–10 gerentibus, antennis primis gracilibus filiformibus, apice setis 3 armatis. Antennis secundis erassis, corniformibus, apice acuminatis, duobus tuberibus non dense setosis ad radicem eminentibus.*

*Hab.* In a salt-spring between Bend-i-nadyr and the well of Agamet, in the mountain-desert east of Murgab, near the Afghan boundary.

Female, taken in April 1887. Colour of the living animal tile-red.—*Bull. Soc. Imp. Nat. de Moscou*, nouv. sér., tome i. (1887), pp. 924–927.